Imię i nazwisko:
Klasa:
Grupa 1
Wynik:

Question 1 ***(1 pt)***
How many solutions does the equation $||x-3|-1|=1$ have?

A. 0 B. 2 C. 3 D. 4

Question 2 ***(1 pt)***
If the line with the equation $3y-\sqrt{3}x+1=0$ crosses the x-axis at the angle α, then

A. $\alpha = 30^\circ$ B. $\alpha = 60^\circ$ C. $\alpha = 120^\circ$ D. $\alpha = 150^\circ$

Question 3 ***(1 pt)***
If the lines given by the equations $y=2x+m-1$ and $y=(m-1)x-m+3$ are perpendicular, then

A. $m=\frac{1}{2}$ B. $m=-\frac{1}{2}$ C. $m=3$ D. $m=-3$

Question 4 ***(1 pt)***
For what values of m is the function $f(x)=(m-3)x+m^2-1$ decreasing?

A. $m \in \{-1,1\}$ B. $m \in \mathbb{R}$ C. $m \in (-\infty,3)$ D. $(3,\infty)$

Question 5 ***(1 pt)***
The equation of the line that passes through $(\sqrt{3},1)$ and makes an angle of 135° with the x-axis is:

A. $y=\frac{\sqrt{3}}{3}x$ B. $y=-\frac{\sqrt{3}}{3}x+2$ C. $y=-\sqrt{3}x+4$ D. $y=-x+\sqrt{3}+1$

Question 6 ***(3 pts)***

Consider the following system of equations:

$$\begin{cases} 2x - y = 4 - a \\ x + y = a - 3 \end{cases}$$

Find the set of values of a for which the solution (x, y) to this system lies in the II quadrant.

Question 7 ***(3 pts)***

Find the coordinates of the point of intersection of $f(x) = |x - 1| + |x + 1|$ and $g(x) = x + 2$.

Question 8 ***(3 pts)***

Find the number of solutions to the equation:

$$|x+1| - |x-2| = x + a$$

depending on the parameter a.

Question 9 ***(3 pts)***

In a triangle ABC, $|BC| = 10$, $\angle ACB = 120^\circ$ and the radius of the circle circumscribing this triangle is equal to 10. Calculate:

a) The sizes of angles $\angle ABC$ and $\angle BAC$.

b) The area of the triangle.

Question 10 ***(3 pts)***

Find the values of the parameter k for which the functions $f(x) = 2x + \frac{k}{2}$ and $g(x) = 3x - 2k$ intersect inside the triangle with vertices $A(-2, 0), B(8, 0)$ and $C(2, 6)$.